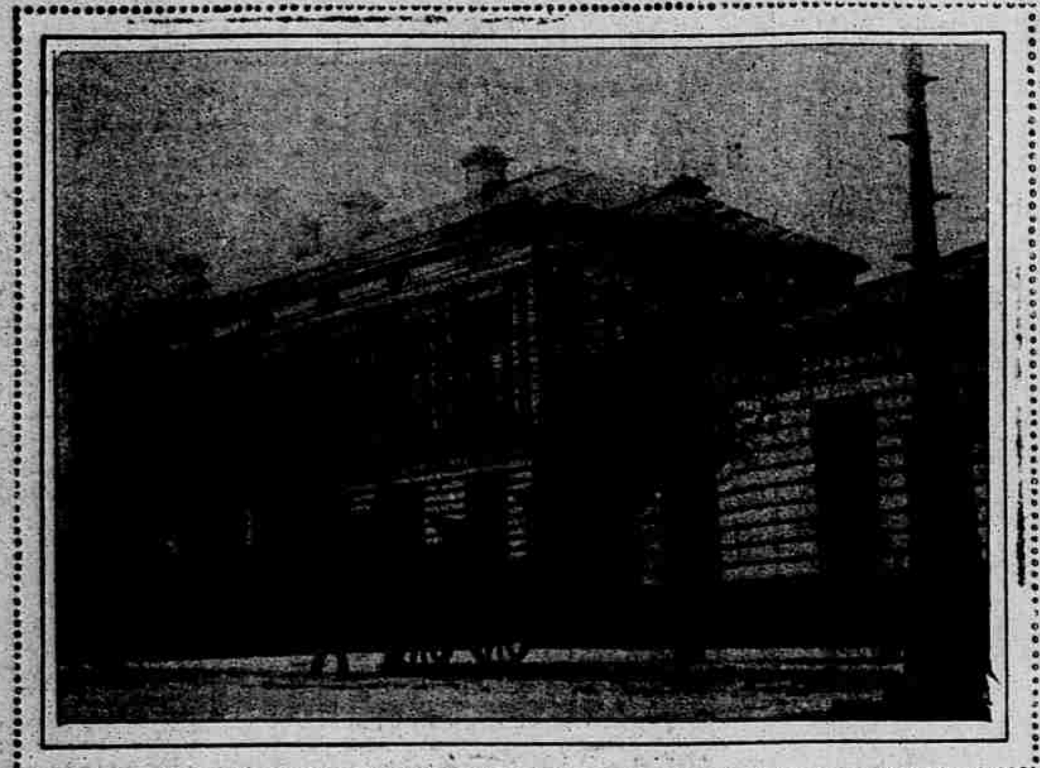
GOLD MINING IN AUSTRALIA.

A VISIT TO THE BALLARAT DIGGINGS, FROM WHICH HAVE COME $350,000,000.



THE MELBOURNE MINT WHICH HAS COINED £82,000,000.

"THE GOLD IS MELTED IN POTS"

POURING GOLD.

PLACER MINING NEAR BALLARAT.

"PUNCHING SOVEREIGNS AT 90 PER MINUTE."

Some Australian Nuggets as Big as Footballs and How They Were Discovered—The Deep Mines of Bendigo, Which Are Now Producing a Fortune—The Vast Desert Sands of Western Australia Which Are Mixed With Gold—The Prospectors Use Camels and Blow the Gold Dust Out With Fanning Mills—How the Government Helps the Miners—A Look at a Ballarat Mining School Built Over a Gold Mine—Some New Processes for Catching Flour Gold—The Melbourne Mint and How It Makes Gold Sovereigns.

Special Correspondence of The Sunday Republic.

Ballarat, Australia, April 9.—In the heart of one of the chief mining districts of Australia, within a stone's throw of where the "Welcome" nugget, a lump of gold as big as a football, was found, surrounded by the smokestacks of quartz mills, I write of the gold of Australia. Under the very floor of my hotel rich deposits of gold have been mined. Every bit of earth in sight has been run again and again through a sieve to wash out the precious dust it contained, and the valley for miles above and below me has been honeycombed with diggings. To-day thousands of men are burrowing here through the bowels of the earth, the best of modern machinery is taking out and hoisting the ore to the surface, and it is even said that the water in some of the deepest mines contains gold. One story is told of how several barrels of water were hermetically sealed and sent away to Paris. They were kept there for years, and when opened were discovered to have precipitated several gold nuggets. As to the truth of this I do not vouch.

The Big Gold Nuggets of Australia.

There is no doubt, however, about Australia's production of enormous gold nuggets. The greatest of them was found shortly after the discovery of gold, away back in the fifties. It had long been known that there was gold in Australia, but it was not until 1851, when Hargraves, an Australian, who had visited California, announced that there was gold here in paying quantities. The first of it was discovered in a water hole in New South Wales, and a month later it was shown that every creek for seventy miles had gold. Later on the placer mines were opened up at Ballarat, and from them came some of these enormous nuggets.

One of the first nuggets weighed 101 pounds, another 98 pounds, and the "Welcome" 184 pounds and 9 ounces, or as much as a good-sized man. There are models of these nuggets in the various mining museums of the Australian capitals. I have seen them in Queensland, in New South Wales and Victoria, and also in the mining schools here. The "Welcome" nugget measured 20 inches in length, 12 inches in breadth and 7 inches in thickness. It was sold in Melbourne for $50,000. Five months after it was discovered another nugget was dug up which was sold for $20,000, and later on came the "Welcome Stranger," which weighed 180 pounds, and was valued at $50,000. In 1858 a lump of gold worth $20,000 was found in New South Wales, and early in the eighties a number of nuggets were discovered, some of great value. So far, California has the record of producing the largest nugget. It weighed 195 pounds, and was taken out of a mine in Calaveras County. The "Welcome" nugget was found at a depth of 180 feet, but most of the others were nearer the surface.

Placer Mines vs. Quartz.

All together $350,000,000 worth of gold have been taken from the earth about Ballarat, and it is estimated that out of this State of Victoria alone the product has been $1,250,000,000. At first all of the gold was alluvial. At present the most of the mining is quartz mining, and some of it is very deep. There are a number of mines that are below 2,000 feet, and the South Star is mining at a depth of 2,500 feet. There are twenty mines here which have paid out more than $15,000,000 in dividends on an original investment of less than $2,500,000.

The mines in Victoria are economically managed. In some of them the ore runs less than three pennyweights to the ton. There is one mine in Victoria which averaged only an ounce of gold to every six and one-half tons of ore last year, and notwithstanding this paid $14,000 in dividends. Among the incidents of economical management are seven mines which have netted 131 per cent on their paid-up capital stock. In these mines only 58 per cent of the gold found is spent in getting it out and paying the cost of management, etc. Over 40 per cent of the gold produced goes to the dividends.

The Deep Mines of Bendigo.

Some of the most remarkable mines of this State are at Bendigo, or Sandhurst, about a hundred miles from Melbourne, where the gold fields yield about a million dollars a year. The mines are very deep. The Lansell mine is already down 3,352 feet, and it is going lower. There are eleven other mines more than 2,400 feet deep, and of these five have a depth of over 3,000 feet. They are being worked at a profit, and it is thought that the heat will not be too great at a depth of 4,000 feet. Bendigo has already produced about $300,000,000 worth of gold, and at the present time 5,000 miners are working there. The men are paid $12.50 a week. They work eight hours a day, with a half holiday every Wednesday. Most of the mines have day and night shifts, three sets of men being employed to fill out the twenty-four hours.

Australia's Big Gold Production.

A steady growth is going on in Australia's gold production. Every State is increasing its product and new mines are being discovered in all parts of the country. Some of the largest mines to-day are in Queensland and Western Australia, in places where gold was not known to exist until a few years ago. Mount Morgan, the richest gold mine of the world, is in Queensland. It is a mountain of iron and gold which has vast fortunes in sight. New South Wales produced a half million ounces of gold in 1899, and Western Australia turned out more than a million and a half ounces in 1899. Indeed, Queensland and Western Australia are now the leading gold producers. In 1900 they produced more than two and one-half million ounces of gold, or more than three-fifths of all the gold mined that year in Australasia. The production of the whole continent and New Zealand in 1900 was more than $76,000,000, and in 1850 more than $80,000,000, or almost three times as much as it was in 1890.

Desert Mines of West Australia.

Indeed, it is hard to appreciate the enormous extent of the undeveloped gold country in this part of the world. I have talked with miners from Western Australia. They tell me that the most of that vast territory has not been touched. Said one mining expert:

"The gold we know of extends over an area of more than 600,000 square miles. You can take dirt from the road at any point along a thousand miles, wash it and find color. Many of the camps are so far in the interior that camels have to be used to carry the supplies. Prospectors travel on camels, and the ore is taken out upon camels. There are parts of the country where you can travel for hundreds of miles and see nothing but sand and rock, but the sand and rock are mixed with gold."

"The chief trouble," continued the miner, "is the lack of water. It is impossible to get enough to wash the gold out, and we have fanning mills through which the dust is run. The fans blow the sand away, and as the gold is heavier it drops to the bottom. Of course, a great deal of gold goes off with the sand, but enough remains to make it pay."

How the Government Helps Miners.

In such places water is worth money. In the Coolgardie fields it has brought as much as 25 cents a gallon, and there is a regular business of taking salt water from the lakes and wells and running it through condensers to make it fresh.

The Government does all it can to help the miners. In Western Australia an appropriation of $12,500,000 for waterworks for one district was recently voted. The Government is laying 200 miles of water pipes there through which it will pump 5,000,000 gallons of water per day. It has set aside a million dollars for reservoirs and artesian wells, and it has its engineers prospecting for water with diamond drills. In the Coolgardie district nineteen tanks and reservoirs have been built, with a capacity of 90,000,000 gallons. Artesian wells have been put down and there are great condensing machines of various kinds. Coolgardie has 20,000 people, and it is connected with Perth, the capital, by railroad.

The Government of New South Wales has offered a reward of $10,000 for the discovery of payable quartz or alluvial gold at a depth of 1,500 feet, and promises to pay $15,000 if such material be found as far down as 2,000 feet. The mines of that State are now only about 1,000 feet, but the people believe that the gold exists at a lower level, and the Government is willing to reward the successful experimenter.

The Victorian Government paid Hargraves for his discovery of gold, and Western Australia paid him to come out and prospect there. It has since paid other prospectors and similar action has been taken by the other colonies.

Mining Schools of Australia.

Nearly every one of the Australian colonies has its mining school and mining museums. All of them have their geologists and geological surveys, which give reports on mines and other such matters. The people are looking out for new things and they pursue the mining industry quite as intelligently as we do.

One of the best mining schools of Australia is in Ballarat. It has 400 students, and is, I venture, as well equipped as any mining college of the United States. I had letters to its superintendent from the director of the mint at Melbourne and its president, Professor Fred Martell, very kindly showed me through it during my stay in Ballarat. The college is built right over a gold mine which belongs to it. It operates this mine chiefly to teach its students. The mine has its shafts and its workings. It is a paying property, and the boys go down into it and do the mining, thus learning practically just how gold should be gotten out of the earth. Connected with the school are all sorts of reduction works operated by the students. It has cyanide plants, a chlorination plant and all the various means of extracting the precious metal from the ore. There are large chemical laboratories, many assay furnaces, and, in short, everything needed for such a college.

For Catching Flour Gold.

In this school I saw a new Australian invention for catching the finest of gold dust which might be of value in the placer mines of our Western States, and also in the gold sands of Alaska and the Pacific Coast. We have a great deal of flour gold in our Western rivers, gold so light that it floats away on the surface of the water, so light that the most of it cannot be saved, although all sorts of processes have been attempted to save it. The same kind of gold is found in New Zealand, and some is caught there by the plush-covered tables of which I wrote in a former letter. By this new invention the ore dust is floated over inclined iron plates, which have little ridges upon them, so raised that the gold is caught as it goes over them. Professor Martell told me that 98 per cent of the gold was saved by this means. The gold dust sticks to the iron, while the lighter dust is carried on by the water. At intervals the plates are turned up, a hose is applied and the gold washed off. The machine could be built, I should judge, for less than $100, and would seem to me to be fitted to the Idaho, Washington and others of our gold fields. It is used for all sorts of free milling gold. I saw ore crushed to a powder and run through a screen which had 3,600 holes to the square inch, holes so small that you could not prick your hand with a pin through them. The dust was run through these holes and over the plates with the result of a saving of 98 per cent of the gold, as I have described.

During my stay in Ballarat I have visited some of the mines. They are very carefully managed, but seemed to me dirtier than the big quartz mines of our country. The timbering is not so well done, and some of the machinery is antiquated.

Ballarat in 1901.

The Ballarat of to-day is not like the Ballarat of fifty years ago. Then it was a city of tents. Now it has perhaps less people, for its population is only 40,000, but it is as well built as any city of its size anywhere. It is typically Australian. The streets are as wide and well paved as those of Washington. The chief one is lined with marble statues, and there are statues scattered throughout the large park in its suburbs. It has good stores, banks and public buildings. It has a theater which will seat 3,000 people, an art gallery containing some fairly good paintings, a stock exchange and a mechanics' institute with a library of 22,000 volumes. It has four other free libraries, and churches of every Christian denomination under the sun. It has flour mills, woolen mills and iron foundries. It has good public schools and many very comfortable homes. Its hotels charge $2 a day, and are good. On one edge of the town is a lake of 600 acres, and another feature is the horse cars, which jolt you to pieces as they take you about it.

Ballarat is surrounded by a rich pastoral and agricultural region. It is seventy-five miles from Melbourne by rail, and on the main road from Melbourne to Adelaide.

How They Coin Gold in Australia.

Speaking of the gold production of Australia, I went through the mint in Melbourne, where for thirty years they have been turning the dust and bullion into sovereigns. Already more than £82,000,000 have been coined, an amount equal to more than 400,000,000 gold dollars. The mint differs from our mints in that it coins only gold, no silver or copper being handled. The gold comes here from different parts of Australia and after coining is shipped chiefly to London. A few $40 gold pieces are made for the Indian rajahs, but the greater part of the metal goes into sovereigns and half sovereigns, worth $5 and $2.50 each.

It was with the director I went through the money mill. We first watched the gold as it came in. Much of it was in the shape of the little dull yellow grains which have been washed out of the streams, and much in the bullion bricks from the smelters. As it was handed over the counter the clerks weighed it, using scales so fine that they will accurately weigh a lump of gold as big as your head or one as small as the point of a pin. After weighing a memorandum of the amount is given to the depositor. The gold is assayed and later on he gets just what it is worth.

Smelting Gold.

Leaving this room we went on to see how the smelting was done. The gold is melted in crucibles or pots of fire clay and plumbago, a material which will stand an intense heat. Each pot has a capacity, I should think, of perhaps half a gallon of liquid gold. It is fitted into a little furnace not unlike the forge of a country blacksmith, save that it is in a long, narrow ledge on one side of the melting-room. There were perhaps a score of such furnaces, and nearly all were filled with gold at the time of my visit. The fuel was coke, and a strong draft made such a heat that the gold bubbled like boiling water. I was dazzled when I looked into the pots. The liquid was green, rather than yellow. I saw it poured out into molds and the stream was a current of emeralds on a bed of light yellow more beautiful than anything of the kind I have ever seen. Later on, when the molds were opened, the green had disappeared, and the metal had become a bright golden yellow.

Golden Hoops.

I next watched them roll out the bars into the hoops from which the gold coins are cut. Each bar was worth $2,500, or £500. It was a ruler of gold 25 inches long, 2 inches wide and not quite half an inch thick. A lot of such bars were wheeled on trucks out of the melting-room into the rolling-room. Here they were pressed between great steel rollers, which made them longer and thinner. At the start each was 25 inches long; at the finish each had become 16 feet long. It had grown as thin as a sovereign and the pressing had polished it so that it shone like a new breastpin. The gold grows hot as it is rolled. The men employed wear thick gloves, or their hands would be blistered.

The next process is cutting the blanks. This is done by steel punches worked by machinery. The machines cut out the cold metal, in much the same way that the baker cuts dough in making ginger-bread men or animal crackers. The only difference is that the gold is cut out by a steel disk worked by steam. You hear it chop, chop, chop, as it punches out sovereigns at ninety to the minute, or at the rate of $27,000 per hour.

Each blank will make a sovereign, and it has just that much of gold in it. Each blank is weighed to see that it is absolutely accurate, and is then run through a coining press which stamps the image of the King upon it and, at the same time, presses in the milling about the edges. All of this work is done with cold steel pressing upon the cold gold. The only heat after the melting is that which comes from the friction caused by the enormous weight on the metal.

FRANK G. CARPENTER.

THE SENIOR SENATOR FROM MISSOURI REMAINS ON DUTY THE GREATER PART OF THE YEAR.

He Gives Each Letter His Personal Attention, Makes Daily Calls at the Departments and Does His Own Marketing.

Special Correspondence of The Sunday Republic.

Washington, May 18.—Senator Cockrell of Missouri is one of the few Senators who remain on duty in Washington the greater part of the year. He has a comfortable residence at No. 1518 R street, where he does the greater part of his work when Congress is not in session. Two or three of his colleagues follow a similar course. The list includes Senators Morgan of Alabama and Hawley of Connecticut.

The senior Senator from Missouri is a very methodical man. He has a punctual, systematic manner of handling business, which enables him to dispose of a large amount of it and at the same time to give it all careful, personal attention. He has an efficient clerk to assist him at times, but the Senator follows closely every matter intrusted to him. In fact, the majority of his letters are answered in his own hand, and those which are not so disposed of are read personally and the answers dictated by the Senator. He has a liking for, as well as a genius for, details. It has been said often by his associates that Senator Cockrell has the best knowledge and memory for details of legislation of all the men in Congress. He knows generally what bills are on the calendar, what have been passed and what are pending before the various committees, and is especially vigilant in regard to measures in which the people of the Southwest are directly concerned.

Winter and summer, the routine of the Senator's work is substantially the same. Much of it is done in his library, during the early morning hours or after his return from the Capitol, when Congress is in session. In summer the method is varied slightly by making daily personal visits to the various Government departments to look after business of his constituents.

The Senator breakfasts about 8, and then for an hour or more is in his library, reading his mail and writing or dictating answers. Such of his letters as necessitate visits to the departments are laid aside, and on his way to the Capitol he stops to attend to them.

He is probably the only man in Congress who does his own marketing. This is attended to on his way to the Senate. It is a habit which the Senator has not varied in years, excepting two weeks last winter when he was ill with the grip. He may be seen daily in the center market, making his [illegible]. The goods are ordered [illegible] he proceeds to the Capitol, reaching there in time for committee meetings.

SENATOR COCKRELL AT HIS DESK IN WASHINGTON.

He is a member of the most important committee of Congress—the Senate Committee on Appropriations—and is generally regarded as the most influential Democrat in either house. He is chairman of the Committee on Engrossed Bills and a member of the Library, Military Affairs, Pacific Islands and Porto Rico and Rules committees.

Although the Senator's strength and influence have grown steadily, and never were rated more highly by both parties than they are to-day, his work is performed with the same steady, persistent attention to details that has marked his course from his entrance to the Senate, in March, 1875.

MISSOURI'S YOUNGEST CITY ATTORNEY.

THOMAS E. RALEIGH.

WRITTEN FOR THE SUNDAY REPUBLIC.

Thomas E. Raleigh of Canton, Mo., a young lawyer, well-known throughout the northeast section of the State, bears the distinction of being the youngest City Attorney in Missouri. Mr. Raleigh is but 23 years of age. At the time of his election he was 22. Mr. Raleigh is of Irish descent, and, like Maude Gonne, the beautiful Irish patriot, of whom he is a great admirer, is characterized by eloquence and wit. His recreative diversions are principally literary and athletic.

A MEMORABLE DRILL OF BATTERY "A."

In one of the competitive drills in which a section of Battery A participated, an unusually high honor, in peace times, was conferred upon the commissioned officer in command of the drill section. This was the memorable drill which took place in Nashville, Tenn., in the summer of 1880.

The St. Louis battery was pitted against the famous drill section of the Louisiana Field Artillery of New Orleans, commanded by Captain Fortier, which was popularly supposed to be invincible; a crack drill section from Battery A of Louisville, Ky., another from the Burns Light Artillery of Nashville, Tenn., and several other artillery commands from various States.

The officer in command of the St. Louis battery's drill section was Lieutenant Peyton H. Skipwith, Jr., afterwards Captain of the battery. The Battery A boys had been encamped in the St. Louis Fair Grounds for weeks preceding the journey to Nashville, drilling four hours daily, morning and afternoon. They had then to "make a reputation," and they were determined to make it. When they left for Nashville they were as hardy and thoroughly trained a lot of young athletes as one could wish to see.

The drill section of the Louisiana Field Artillery was the favorite in the Nashville betting, and the betting was high. That section drilled one day preceding Battery A of St. Louis, and put up what was acknowledged to be the finest drill it had ever gone through. This added to the confidence of the backers of the Louisiana Field boys, and the odds on the Pelican State battery went higher than ever.

The St. Louis drill section went into the field in the forenoon of a hot July day. Its drill programme was expected to consume exactly one hour's time. So swiftly and accurately was the work done that the programme was completed in forty minutes. Lieutenant Skipwith then saluted the regular army officers and asked their permission to put the section through the mounted drill by bugle calls without the word of command. Consent was given, and the Battery trumpeter, Lees Maude, son of John B. Maude, one of St. Louis's best-known citizens in earlier days, was ordered to duty on the drill field. The drill by bugle calls was gone through without an error. Then, as if to show their excellent physical condition, the boys of Battery A's drill section limbered up the gun and caisson, stationed themselves at the poles and wheels, and left the drill ground on a swift run, as fresh as they had entered it an hour before.

The first prize of $500 was awarded to Light Battery A of St. Louis. The regular army officers who had acted as judges of the drill were most generous in their praise of the section. The senior judge, a Colonel commanding an artillery regiment in the regular service, was so favorably impressed by Lieutenant Skipwith's abilities as an officer that he earnestly urged him to enter the regular service, promising sufficient influence to secure his appointment as Lieutenant by the President. This is an uncommon compliment for a regular army officer to pay a militiaman. It was the strongest possible proof that the Colonel of the regulars believed he had found a [illegible] good artillery officer [illegible]